Methane Recovery in Russian Gas Sector: XA-83442701-0
Quarterly Project Report to EPA: Second Quarter

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B. Reporting Period: January 1 to March 31, 2012

C. Current Status:

The first draft of the third party independent expert review (IER) of Vniigaz's dobycha Yamburg pilot inventory report and its report on recommendations for a Gazprom corporate emissions management system is complete.

A team of independent experts, including Alexey Kokorin (WWF Russia) and Vladimir Berdin (United Nations Educational, Scientific and Cultural Organization UNESCO), undertook the independent review based on an in-depth analysis of the following documents:

- "Information report on the procedure of registration of methane greenhouse gas emissions at Gazprom's facilities";
- "Gazprom's methane emissions case study inventory for a Gazprom dobycha Yamburg representative gas unit (UKPG-1B)";
- "Development of recommendations for establishing a corporate methane emission management system in Gazprom";
- Gazprom's annual publicly released environmental reports;
- IPCC inventory guidelines;
- Carbon Disclosure Project information materials;
- Corporate GHG emission inventory reporting protocols and other related documents.

The review focuses solely on the methodological and design aspects of the emissions inventory and corporate emissions management reports undertaken by Gazprom-VNIIGAZ from 2010-2011 for Gazprom and its daughter company Gazprom dobycha Yamburg Company.

The IER does not constitute an audit. It does not examine the primary data, calculation process or measurement techniques applied for the estimation of methane emissions by Gazprom. It also does not include a review of all the requisite forms and data since such a review is beyond the scope of this effort. The IER analyzed the following elements of the inventory case study report:

- Inventory methodology utilized by Gazprom-VNIIGAZ.
- Systems that Gazprom uses to collect and process primary data;

- Practical implementation and enforcement of data collection and processing systems;
- Reviewed assessment of uncertainties for methane emission inventory;
- Reviewed the recommendations for a corporate system of methane emissions control developed by Gazprom-VNIIGAZ.
- Based on the above, formulated recommendations on future steps for developing corporate inventory practices at Gazprom.

Overall, the reviewers found that the methodologies used for the estimation of methane emissions by Gazprom-VNIIGAZ comply with the requirements of the IPCC Guidelines. The methodologies for calculation of emissions accurately apply the IPCC default values for methane emission factors, while the measurement approaches applied at Gazprom dobycha Yamburg Company correspond to the IPCC advanced tiers recommended for GHG emissions inventories.

According to the inventory report, it is estimated that the vast share of total methane emissions identified at UKPG GTU-1B come from process (organized) emissions, amounting to 99.85%. The share of emissions as the result of fugitive (non-organized) leaks is .15%.

The major share of process methane emissions from natural gas enters the atmosphere via equipment stacks (51%) and degassing stacks (35%). The report fines process emissions from combustion products to be "insignificant," amounting to less than 1% of the total share of methane emissions for the facility. The majority of emissions released from combustion products originate from the exhaust pipes of the GCU units (84.2%) and flaring (10.1%).

For fugitive emissions, main sources of emissions were analyzed directly using modern techniques (stationary and handheld gas analyzers). The directed inspection determined the main source of methane emissions derives from vents stacks (74%) with the remaining share coming from fittings (26%). Five vents stacks account for the majority of the leaks from vents stacks (66%) and leaks from valves and gates account for the main share of methane leaks from fittings (82%).

Mr. Kokorin and Berdin found the use of direct instrumental inspection to be a highly effective and useful methodological practice, and recommend its replication at Gazprom's corporate-wide facilities and the Russian gas sector as a whole.
The reviewers propose the following recommendations to further strengthen and develop a rigorous corporate methane emission inventory system at Gazprom:

1. The inventory reports need to include aggregated data on all sources of emissions with clear identification of the annual emissions of methane in compatible values (tons of CH_4, tons of CO_2-equivalent);
2. As we understand, the inventory of methane emissions by Gazprom dobycha Yamburg Company (UKPG-18 unit) showed approximately 30,000 tons of CO_2-equivalent per year. This is relatively low level of emission. It would be desirable to

obtain some description (explanation) of whether such low emissions level is typical for the similar units of Gazprom dobycha Yamburg Company and what is the estimate of overall methane emissions per annum in the Company.

3. The technical and methodological aspects of the instrumental monitoring of emissions from non-organized sources are described in brief, general terms. For further reporting it may be important to include a special chapter in the report with a more detailed description of such techniques and methods of measurement, equipment characteristics, uncertainty valuation, sampling selection, etc.

4. The inventory report provides very limited information on the calculations of uncertainties. Though it is not an obligatory requirement, the IPCC's "Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories" (2000) provides all the necessary methodological approaches to the estimation of uncertainties and effective data quality management. In the future, application of such methodologies will assist in improving the quality of data and identify possible sources of deviation of inventory results.

5. In our view, it would be desirable to include the emissions inventory data in a simple format, probably in the table forms consistent with the national inventory data format (simplified, covering only methane emissions from gas sector).

6. It would also be useful to include some concluding information on applicability of the inventory results for the corporate emission management system and development of specific measures on emissions control in the final section of the reports.

7. Based on corporate accounting and reporting standards, the following recommendations may be appropriate for improving Gazprom's methane emissions inventory system:

A quality management system for a company's inventory program should address all four of the inventory components: methods, data, inventory processes and systems and documentation. To implement the system, a company should take the following steps:

- *Establish an inventory quality team;*

- *Develop a quality management plan*;

- *Perform generic quality checks*;

- *Perform source-category-specific;*

- *Review final inventory estimates and reports*;

- *Institutionalize formal feedback loops*;

- *Establish reporting, documentation, and archiving procedures*.

In the second draft of the report, the IER will be subject to review for both substance and syntax. From the substantive point of view, the EDF team will explore incorporating recommendations based on the EPA's Subpart W rules on US offshore and onshore gas production, as well as more rigorous inventory methodologies developed by Russian JI project developers for the oil and gas sector. We welcome EPA's guidance in this matter. We will present information on an expanded version of the IER at the project's final workshop now scheduled for a later date in September 2012 to accommodate EPA travel schedules. In addition to presenting the results of the third party independent review, the workshop will touch on themes that explore options for

incentivizing methane emissions reductions at the regional, national, and international level.

Together with EDF's Bryan Weigle, Gazprom Vniigaz is submitting an article to the Russian trade publication, "Gas Industry of Russia" http://gasoilpress.com. The article, slated for release in early June, highlights the development of the methodological guidelines for the Gazprom dobycha Yamburg emissions inventory.

In addition, an environmental impact assessment of the oil and gas industry on localized ecosystems has been completed. The assessment, which is presently available only in Russia, pays particular attention to the effect of the UGS pipeline system on northern regions of Siberia. An English version of the executive summary and chapters relevant to Gazprom's impact on the local environment is in development.

Other project relevant activities and developments occurring from January to March 2012 are listed below:

- The project results were cited in a policy note on methane emissions control in the oil and gas sector, prepared by the Expert Group of the Ministry of Economic Development and the Business Russia Association (Delovaya Rossia) The policy note and related materials were delivered to the Presidential Administration, federal governmental bodies, and expert community (February 2012);

- Project results presented and discussed at the meetings of the Working Group under the Ministry of Economic Development of the Russian Federation on a post-2012 International Climate Change Agreement (February 1 and March 15, 2012);

- Project results disseminated at the international conference: "Global Climate Change: Implications for Russia and the Arctic Region," hosted by HSE and WWF-Russia (March 20, 2012)

- Presented project findings at the International Conference "Climate Change and Energy Policy: Analysis and Modeling" held in Moscow, at the Higher School of Economics (HSE) (March 28, 2012);

D. Deliverables and Works in Progress

- Combined independent review of Vniigaz's pilot inventory report and information report on recommendations for the development of a corporate methane emissions management system (Appendix 1);
- Russian language draft of article on the development of methodological guidelines for the Gazprom dobycha Yamburg emissions inventory, which is to be submitted to the Russian trade publication, "Gas Industry of Russia" (Appendix 2);

- Completion of environmental impact assessment of the oil and natural gas sector with particular focus on the sector's impact on the fragile environment of Northern Russia; Russian language version (Appendix 3).

E. Upcoming Events

- No upcoming events in next reporting period

F. Budget:

Expenses incurred during this quarter have been or are being billed to EPA.